

Office Action Summary

Application No.

10/592,943

Applicant(s)

SAOMOTO ET AL.

Examiner

MICHAEL CARTER

Art Unit

2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2 and 5-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-2, 5-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI-108)
Paper No(s)/Mail Date _____
- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date 2/13/09
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. **Claim2** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 2 recites "wherein said second support is provided correspond to each ridge." "Said second support" lacks antecedent basis as claim one recites "a pair of second support." For purposes of the art rejection below, it is assumed that claim 2 should read "each support of the pair of second supports is provided corresponding to each ridge."

Claim Rejections - 35 USC § 103

3. **Claims 1-2 and 5-12** are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,075,800 (Spear) in view of US Patent 6,618,420 (Gen-Ei).
4. **For claim 1**, Spear teaches a ridge waveguide laser with a ridge (figure 1, label 14) and two supports for protecting the ridge (figure 1, portion of label 10 to right of trough 12 and portion of label 10 to the left of trough 12) and the sidewalls of the support region extend directly downward into an underlying substrate (figure 1, label 11).
5. Gen-Ei teaches placing two lasers (figure 3a, labels 40 and 41) side by side with an isolation groove between them and on the outside edges, which extends into a substrate (label 10) in order to form a multi-beam laser (abstract).

6. It would have been obvious to one of ordinary skill in the art at the time the invention was made to form two of the lasers taught by Spear side by side as taught by Gen-Ei in order to form a multi-beam laser.
7. The above combination teaches a plurality of ridges (Spear, label 14 from 1st and second laser) arranged in parallel with each other (Gen-Ei figure 5B) inside a pair of first supports protecting said ridges (Spear, figure 1, label 12, support on the outside edge of each laser); a pair of second supports provided between said plurality of ridges and protecting said ridges (Spear, figure 1, label 12, support on the 1 side edge of each laser); a monitor region provided to the outermost edge of said semiconductor laser element (Gen-Ei, figure 3a, groove on outside edge of laser 41) and wherein sidewalls of said second supports (Spear, figure 1, sides of laser) extend directly downward into an underlying substrate (Spear, label 11) forming a second isolation groove (Gen-Ei groove between lasers 40 and 41) between said adjacent sidewalls.
8. While the combination does not explicitly teach the monitor region is to monitor progress of the etching and serves as an isolation groove, this recites an intended use which does not distinguish the structure from the prior art and has not been given patentable weight.
9. **For claim 2**, the combination teaches each support of the pair of second supports is provided corresponding to each ridge. Each ridge (Spear, label 14) corresponds to a second support (support portion of label 10 for each laser between the ridges).

10. **For claims 5-7**, Spear teaches a distance from a center of said ridge to ends of said first and second supports on sides thereof facing said ridge is set within a range from more than 20 μm to less than 50 μm ; from more than 20 μm to 40 μm or less; from more than 20 μm to 33 μm or less respectively (column 3, line 42 and column 4, lines 10-13 teach that a typical distance is 24 μm).

11. **For claim 8**, the combination does not teach a distance from a center of said ridge to ends of said first and second supports on sides thereof facing said ridge is set within a range from 30 μm or more to 33 μm or less.

12. However, the range taught in Spear is listed as a typical range (column 4, lines 10-14) and it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the distance in the range from 30 μm or more to 33 μm or less since the ranges are close enough that one skilled in the art would have expected them to have the same properties. *Note that the exact range is taught in US Patent 6,411,642 figure 1c*. One might have been motivated to use a distance between 30 and 33 μm if they already had a mask for the device and did not want to make a new mask.

13. **For claims 9-12**, the combination does not explicitly teach the ratios of areas and widths of the supports.

14. However, Spear teaches the supports are used to provide a thermal conduction path as well as mechanical stability between the chips and substrate (column 2, lines 23-25).

15. It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to adjust the size of the supports in order provide sufficient thermal conduction as well as mechanical stability since a change in size is generally considered within the ordinary skill in the art.

16. Note that it is well know in the art to increase contact area in order to improve heat radiation characteristics. See, for example, US PG Pub 2002/0024985 paragraph 23.

17. **Claims 13** is rejected under 35 U.S.C. 103(a) as being unpatentable over Spear in view Gen-Ei and further in view of US Patent 6,199,561 (Mitsubishi).

18. **For claim 13**, the combination of Spear and Gen-Ei teaches arranging a plurality of ridges in parallel with each other on an element surface (Gen-Ei, figure 3A, label 10) and providing each ridge with a plurality of supports to sandwich each ridge as discussed in the rejection of claim 1 above providing a block layer on surfaces of said ridges and said supports (Spear, figure 1, label 16) and providing an electrode layer covering the ridges (label 15).

19. Spear does not detail that the patterning (leaving the top of ridge 14 exposed to electrode 15) includes applying a protective film by spin coating to a surface of said block layer; removing said protective film covering a top surface of said ridges; with said protective film serving as a mask.

20. However Mitsubishi teaches the steps of applying a protective film by spin coating to a surface of a layer; removing said protective film covering a top surface of a

selected area; with said protective film serving as a mask are well known in the art for producing semiconductor devices (column 1, lines 14-24).

21. It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to use Mitsuhashi method of patterning for the patterning required in the method of the previous combination.

Response to Arguments

22. Applicant's arguments with respect to claims 1-2 and 5-13 have been considered but are moot in view of the new ground(s) of rejection necessitated by amendment.

Conclusion

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL CARTER whose telephone number is (571)270-1872. The examiner can normally be reached on Monday-Friday, 7:00 a.m.-4:30 p.m., EST.

24. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

25. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MC/

/Minsun Harvey/
Supervisory Patent Examiner, Art Unit 2828